

REMARKS

Claims 1-16 are pending in the application. Favorable reconsideration of the application, as amended, is respectfully requested.

I. OBJECTION TO DRAWINGS

Applicants will resubmit the formal drawings in good time once the application has been allowed.

II. OBJECTION TO SPECIFICATION

The specification has been revised to supplement the information regarding the related application, and to correct minor typographical errors. Withdrawal of the objection is respectfully requested.

III. REJECTIONS OF CLAIMS 1-16 UNDER 35 U.S.C. §103(a)

Claims 1-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the RMII Specification (dated March 20, 1998) in view of Ballance et al. (U.S. Patent No. 4,748,621). The rejection is respectfully traversed for at least the following reasons.

Claims 1-14, and 16 relate to MAC-PHY communications, and claim 15 relates to MAC-MAC communications. Specifically, claims 1, 15, and 16 recite use of time-division multiplexed receive and transmit control signals. For the receive path, the present invention utilizes the sync pulse SYNC (402a), the receive data valid signal RX_DV (402b), the receive error signal RX_ER (402c), and the carrier sense signal CRS (402d), which are time-division multiplexed in a single, receive control signal RXCNTL (402) (page 12, line 1 – page 13, line 15). Similarly, for the transmit path, the invention utilizes the sync pulse SYNC (502a), the transmit enable signal TX_EN (502b), and the transmit error signal TX_ER (502c), which are time-division multiplexed in a single, transmit control signal TXCNTL (502) (page 14, line 8 – page 15, line 17). One of the features recited in claims 1, 15, and 16 is the time-division multiplexed control signals for the receive and transmit paths.

The RMII Specification, however, fails to teach or suggest use of the time-division multiplexed control signals. The RMII Specification merely shows separate control lines which are not time-division multiplexed between the MAC and PHY interfaces (FIGURE 1 of the RMII Specification). The RMII Specification is completely silent about multiplexing the control signals into a single signal line. Moreover, the RMII Specification fails to teach or suggest one of the features recited in claim 15, namely, interfacing between two MACs. Figure 1 of the RMII Specification shows only a MAC-PHY interface, not a MAC-MAC interface.

Ballance et al. relates to a time division multi-access (TDMA) system, which uses a multipoint radio system including three outstations (FIG. 1, column 3, lines 19-45). Specifically, Ballance et al.'s system exchanges frames, each of which contains 8000 bytes of data (column 3, lines 59-62), and the multiplex in Ballance et al. takes the form of a frame which contains 32 slots each adapted to contain a byte, or eight bits (column 5, lines 35-44). Therefore, Ballance et al. may suggest multiplexing frames, or data packets in the context of wireless communications, but not multiplexed control signals on control signal lines.

In fact, the term "control signals" appears only twice in Ballance et al. at column 4, line 38, and column 5, line 29. In both appearances, these "control signals" are not multiplexed in any way. Furthermore, Ballance et al. contains neither the term "control line" nor the term "control signal line." Accordingly, Ballance et al. in no way teaches or suggests the time-division multiplexed control signals on control lines as recited in claims 1, 15, and 16. As a result, Ballance et al. simply does not make up the deficiency of the RMII Specification in this regard. Accordingly, even a prima facie case of obviousness has not been established here.

Moreover, contrary to the Examiner's assertion, it is respectfully submitted that those skilled in the art would never combine the RMII Specification and Ballance et al. since the two references relate to totally different technology fields, and the references provide no motivation or incentive to combine them. The RMII Specification describes MAC-PHY interface architecture, where a control line sends a non-multiplexed control signal. On the other hand, Ballance et al. describes exchanging frames including bytes of data between wireless outstations. The TDMA method disclosed in Ballance et al. fails to teach or suggest multiplexing control signals into a single wire because the system multiplexes data frames into a radio frequency channel. Thus, a person having ordinary skill in the art of Ethernet interfaces (i.e., for sending control signals on control lines between a MAC and a PHY) would not find it obvious to look to the teachings of the TDMA wireless communications between radio outstations. Specifically, the contexts of the RMII Specification and Ballance et al. differ with respect to:

(i) the object which is exchanged between the two units (control signals in the RMII Specification v. frames including bytes of data in Ballance et al.);

(ii) the way in which the object is exchanged (on control lines in the RMII Specification v. through radio channels in Ballance et al.); and

(iii) the two units which exchange the object (MAC and PHY chips, or MAC and MAC chips in the RMII Specification v. two stand-alone radio outstations in Ballance et al.).

In addition to not teaching or suggesting the time-division multiplexed control signals on control lines, the RMII Specification and Ballance et al. also fail to teach or suggest the

important advantage achieved by the present invention of reducing the number of pins from eight to four as described in page 5, lines 10-18 of the present specification. The present invention achieves this advantage by utilizing the time-division multiplexed control signals on the receive and transmit control lines as recited in claims 1, 15, and 16. As noted in the specification at page 3, lines 9-16, reducing the number of pins in a MAC to PHY or MAC to MAC interface is highly desirable because it reduces chip cost and allows for increased density on chips.

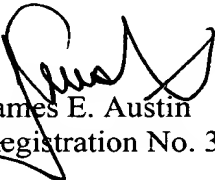
Therefore, Applicants respectfully submit that the combination of the RMII Specification and Ballance et al. by the Examiner is completely out of context. There is in fact absolutely no motivation or incentive to combine the two references, and as noted above, the combination fails to achieve the present invention.

For at least the above reasons, Applicants respectfully submit that claims 1, 15, and 16, and the claims which depend therefrom are patentable over the RMII Specification in view of Ballance et al.

IV. CONCLUSION

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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